

# Subnet

A subnet in its most basic form is a group of IP addresses, subnetting is the act of breaking up chunks of address space into smaller sizes.

Technically speaking, there are two *types* of subnetting, but in reality only one is used in today's modern networks. In the older times, and specifically with IPv4, you had classful networking, which is where terms like class A, B, C, D and E came from, if you've ever heard them. This was how subnetting was originally done with IPv4, and it's part of why some random organizations hold absolutely excessive amounts of v4 address space, further increasing the shortage of IPs on the internet in the v4 address space. Later on, classless networking came around (the type we use today) and it's typically denoted with a slash followed by a number to specify the subnet mask. A subnet mask identifies which part of the IP space identifies the network (first chunk) and which part can identify hosts (the second chunk)

For example, a /24 in IPv4 networking would look like this

23.133.248.0/24

Red is the network ID, and purple is the host ID, since IPv4 IPs allow for 255 addresses per octet (each number in-between dots is an octet, that allows for 255 valid IPs out of a /24)

IPv6 is similar, except it's hexadecimal and its chunks are separated with colons (:). There are also 8 full chunks in a v6 IP, meaning a v6 IP is 128 bits, vs IPv4's 32 bits.

a /48 in IPv6 would look like this

2602:fb2:dead::/48

If you noticed there is no host bits there, that's because two colons back to back fills the rest of the IP with zeros, that IPv6 address expanded out into full form would look like this

2602:fb2:dead:0000:0000:0000:0000:0000

And since it's hexadecimal, that goes all the way to 2602:fb2:dead:ffff:ffff:ffff:ffff:ffff!

That's a lot of IPs!

v6 is the future, and it's what you should be using in all new network buildouts.

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